

## SINGLE USE RECYCLABLE INFANT FEEDING BOTTLE

### Field of the Invention

[0001] The present invention relates to a feeding bottle and more particularly to a single use recyclable infant feeding bottle that has an integrated assembly featuring a teat and a sealing cap with a snap-on feature, so that the single use recyclable infant feeding bottle can be manufactured efficiently and economically.

### Background of the Invention

[0002] A conventional feeding bottle generally comprises a container, a cap and a nipple. The nipple is nested in the cap and the nipple tip is projected over the bottle. The cap and the container are threaded onto each other through the preset inner and outer threads thereon. The container, cap and nipple are reusable. A standard nipple is commonly made of either natural or synthetic rubber, both of which are flexible and compressible. An opening in the tip end of the nipple permits liquid to be withdrawn from the container in response to a sucking action by a feeding infant.

[0003] Reusable feeding bottles are major sources of concern for parents and other care givers. The feeding bottles must be properly cleansed and sterilized in order to prevent introduction of harmful contaminants into infant formula and other beverages to be consumed by the infant. The sterilization process is time consuming; moreover, the bottle preparer may fail to clean a reusable bottle thoroughly and thereby placing the infant at risk.

[0004] Different disposable bottles have been designed for resolving or attenuating the problem of contamination. For example, US Patent 5,579,935 discloses a disposable container made of plastic film that is deployed within a container shell. The open end of the disposable container folds across an end of the container shell and is secured by a flexible rubber nipple which clamps the disposable container in place. In this feeding system, the container is disposable but the nipple and the shell are reusable. US Patent 6,138,847 discloses a disposable non-reusable baby bottle that includes a container having a rigid flange at the container's open end, a nipple having a radially enlarged flange, and a snap ring which locks the nipple to the open end of the container. Once the baby bottle is assembled, the snap ring prevents the nipple from being disassembled from the container. Furthermore, PCT WO 02074227 discloses a single-use feed bottle that has a body to be sealed in a fluid tight manner by means of a closure and a teat.

[0005] The market demands that a single use recyclable infant feeding bottle be cost-effective and user-friendly. However, these available designs with multiple pieces suffer one or more of the problems including the complexity of using, inefficiency of manufacture, and prohibitive cost. Therefore, there is a need to have a simple single use recyclable infant feeding bottle that can be not only used easily and hygienic but also manufactured efficiently and economically.

### Summary of the Invention

[0006] The present invention relates to a single use recyclable infant feeding bottle. More specifically, the single use recyclable infant feeding bottle of the present invention has an integrated assembly that features a teat

and a sealing cap in one piece. The sealing cap has a snap-on feature that provides a user-friendly closure means for a leak proof seal. The single use recyclable infant feeding bottle of the present invention is so designed to minimize risk of contamination, to lower per unit cost, and to be manufactured efficiently and economically.

[0007] In accordance with the forgoing, the present invention provides a single use recyclable infant feeding bottle that comprises a container for holding liquid and an integral assembly for providing a teat and a snap-on feature to engage with the container. The container has a container lip that includes an outer securing hook and an inner securing rib, thereby forming first half of the snap-on feature. The integral assembly features a teat for sucking and a sealing cap for receiving the teat and engaging with the container. The sealing cap features a sealing lip that has an inner annular flange with a circumvential hump and an outer annular flange with a locking flange, thereby forming second half of the snap-on feature. When the single use recyclable infant feeding bottle is assembled through the snap-on feature, the circumvential hump engages with the inner securing rib to form a leak proof seal for preventing the liquid from discharging, and, at the same time, the locking flange engages with the outer securing hook to reinforce the leak proof seal and prevent the disengagement of the container and integral assembly.

[0008] Accordingly, one object of the present invention is to provide a feeding bottle that can be easily assembled for a single use, so that the possibility of contamination is virtually or substantially eliminated.

[0009] Another object of the present invention is to provide a feeding bottle that can be manufactured easily in two pieces, so that the single use recyclable infant feeding bottle is cheap.

[0010] The objects and advantages of the invention will become apparent from the following detailed description of preferred embodiments thereof in connection with the accompanying drawings in which like numerals designate like elements.

### Brief Description of the Drawings

- [0011] FIG. 1 is a front elevational view of the single use recyclable infant feeding bottle;
- [0012] FIG. 2 is a top plan view of the single use recyclable infant feeding bottle;
- [0013] FIG. 3 is an exploded, elevational perspective view of the single use recyclable infant feeding bottle;
- [0014] FIG. 4 is a front sectional elevational view of the single use recyclable infant feeding bottle according to section A-A in FIG. 2;
- [0015] FIG. 5 is an enlarged partial sectional view of the snap assembly;
- [0016] FIG. 6 is an enlarged partial sectional view of the vent;
- [0017] FIG. 7 is an enlarged partial sectional view of the top of the teat; and
- [0018] FIG. 8 is an enlarged partial upside-down view of the sealing cap.

### Detailed Description of the Drawings

[0019] Referring now to the drawings in detail wherein like reference numerals have been used throughout the various figures to designate like elements, there is shown in FIG. 1 a single use recyclable infant feeding

bottle constructed in accordance with the principles of the present invention and designated generally as **10**.

[0020] Referring now to FIGS.1-3, the single use recyclable infant feeding bottle **10** as shown comprises a container **20**, an integrated assembly **30**, and a teat cover **50**. The container **20** has a bottom face **21** and a peripheral side wall **22**. The peripheral side wall **22** is integrally coupled to and extending upwardly from the bottom face **21** for defining an interior space **23**. The shape of the peripheral side wall **22** could be any known to anyone skilled in the art. A cylindrical shape is exemplarily illustrated in FIG. 3. The interior space **23** holds any liquid including milk, juice, water, and formula. The peripheral side wall **22** ends up with an open end portion **24** with a container lip **25**. The container lip **25** provides means for assembling the single use recyclable infant feeding bottle **10**.

[0021] Referring now to FIGS. 4 and 5, the container lip **25** is engaged with a sealing lip **39** of a sealing cap **32**, which will be discussed in detail later. The container lip **25** has an outer securing hook **26** that extends outwardly from the container lip **25**. The outer securing hook **26** could be an outward extension of the tip of the container lip **25** as illustrated in FIG.5. It is known to anyone skilled in the art that the outer securing hook **26** is not limited to be disposed at the tip of the container lip **25**. The container lip **25** also has an inner securing rib **27** that extends inwardly from the container lip **25**. The inner securing rib **27** is spaced down further from the outer securing hook **26** of the container lip. The container may be made of plastic, polypropylene, polycarbonate, polystyrene, or polyethylene.

[0022] Referring still to FIG. 3, the integrated assembly **30** has a teat **31** and a sealing cap **32**. The teat **31** is a standard teat, which is defined herein to mean a feeding teat of the type commonly used with reusable baby bottles

utilizing screw-on caps. Standard teats are commonly made of either natural or synthetic rubber, both of which are flexible and compressible. In certain embodiments, the teat **31** is made of thermoplastic elastomer. The teat **31** may be made of latex or silicon. The teat **31** has an outwardly peripheral extension **35** that extends from its base. In certain embodiments, the outwardly peripheral extension **35** is integrally moulded with the sealing cap **32**.

[0023] When an infant suckles on a bottle to draw liquid therefrom through a teat, the withdrawal of liquid produces a partial vacuum within the bottle. As the pressure differential increases, it becomes extremely difficult for the suckling to draw liquid from the bottle. Thus, referring now to FIGS. 3, 4, 6 and 8, in certain embodiments, a valve **44** is integrally disposed onto the edge of the outwardly peripheral extension **35** of the teat **31**. The valve **44** may be moulded with the teat **31** at the same time. The valve **44** has an opening at its tip within the container **20** to allow the air into the container **20** when an infant suckles the feeding bottle **10**. The valve **44** may be made of thermoplastic elastomer. The valve **44** may be any one known to the person skilled in the art including disk-shaped valve, various diaphragms and one-way valves.

[0024] Referring now to FIG. 3, the sealing cap **32** has a frusto-conical configuration. For the convenience of description, the sealing cap **32** is arbitrarily designated with an upper portion **33** and a lower portion **34**. The upper portion **33** of the sealing cap **32** has a top surface **36**. The inner edge of the top surface is upwardly extended so as to form an upwardly extension for allowing the liquid in the container flow to the teat. An annular recession is also formed on the top surface **36**. The annular recession is so formed outwardly from the upwardly extension such that it receives the outwardly

peripheral extension **35** of the teat **31**. Now still referring to FIG. 3 in combination with FIGS. 6 and 8, the top surface **36** has a vent hole **45** for receiving the valve **44**.

[0025] Referring still to FIG. 3 in combination with FIGS. 4 and 5, the lower portion **34** of the sealing cap **32** has a sealing lip **39**. The sealing lip **39** has an inner annular flange **40** extending downwardly from the end tip of the lower portion **34** and having a circumvential hump **41** for engaging with the inner securing rib **27** of the container **20** to form a leak proof seal for preventing the liquid from discharging from the container. The sealing lip **39** also has an outer annular flange **42** extending outwardly first and then downwardly from the end tip of the lower portion **34** and having a locking flange **43** inwardly extending horizontally from the outer annular flange with a lower angularly disposed shoulder surface. The locking flange **43** engages with the outer securing hook **26** of the container so as to reinforce the leak proof seal formed between the circumvential hump **41** and the inner securing rib **27**. The outer annular flange **42** is spaced from the inner annular flange **40** so as to receive the container lip **25**. In certain embodiments, the inner annular flange **40** may be comprised of three or four segments that are equally spaced. The sealing cap may be made of plastic, polypropylene, polycarbonate, polystyrene, or polyethylene

[0026] Referring to FIGS. 3, 4 and 7, the single use recyclable infant feeding bottle **10** may optionally include a teat cover **50**. The teat cover **50** is so disposed onto the top of the integral assembly **30** as to protect the teat **31** from contact with external environment when the teat is not suckled by the infant. The teat cover **50** is especially useful when the integral assembly **30** is held by a hand during the process of assembly of the single use recyclable infant. Referring now particularly to FIG. 7, the teat cover **50** has an annular

rib **51** formed on its inner surface. Thereby, when the teat cover engages with the sealing cap **32**, the annular rib **51** presses against the top of the teat to provide further protection of the teat from leaking or exposing its sucking holes from external environment. The teat cover **50** may be made of plastic, polycarbonate, polystyrene, or polyethylene.

[0027] It is apparent now that the single use recyclable infant feeding bottle of the present invention is easily assembled for use. When needed, one could pour liquid into the container **20** first, then snap-on the integral assembly **30** with or without the teat cover **50** onto the container. Thus, the single use recyclable infant feeding bottle is ready for use. Also, the single use recyclable infant feeding bottle is reduced essentially into two pieces, the container and the integral assembly. This design makes the manufacturing process efficient and economical. Thus, the single use recyclable infant feeding bottle could be offered at a very competitive price.

[0028] While the foregoing has presented descriptions of certain preferred embodiments of the present invention, it is to be understood that these descriptions are presented by way of example only and are not intended to limit the scope of the present invention. It is expected that others skilled in the art will perceive variations which, while differing from the foregoing, do not depart from the spirit and scope of the invention as herein described and claimed.